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Telephony

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OPEN THE BOX AND LOOK INSIDE

In 1988, ISDN became a reality. In '89 comes the evolution

AT&T, US SPRINT CAPTURE FTS 2000

Martin Marietta/MCI left out in the cold

GTE, IBM JOIN ON ISDN

Joint trials will connect private and public networks

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Telephony

INTEGRATING VOICE & DATA COMMUNICATIONS

ISDN providers have given their customers plenty of presents this year, and it's guaranteed that they won't be stashed in some closet. Cover design by Laura M. Doyle; photography by Steve Donisch

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Open the box and look inside

MICHAEL WARR, Technical Editor
ELLIS BOOKER, Features Editor

To Subscriber
From Us All
To Her
From Stephney

AMERITECH

Trials/Customers	Access	Switch	Status
Illinois Bell			
McDonald's Corp.	BRI	AT&T 5ESS	Serviced by 400-plus lines
Motorola Inc.	BRI	NT DMS-100	Switch to be installed 1st quarter 1989
Bell Labs	BRI	AT&T 5ESS	1200 lines to be installed in 1989
Indiana Bell			
University of Indiana	BRI	NT DMS-100	Selling 50 lines 1st quarter 1990
South Bend	BRI	AT&T 5ESS	August 1988-March 1989 internal
Indianapolis	BRI	NT DMS-100	July 1989-Dec 1990 internal
Michigan Bell			
Michigan Bell	BRI	NT DMS-100	Nov 1988-June 1989
Ohio Bell			
Ohio Bell	BRI	AT&T 5ESS	Nov 1988-June 1989
Wisconsin			
Alverno College	BRI	Siemens EWSD	March 1988-1989

BELL ATLANTIC

C&P of Maryland			
Crieville, Maryland	BRI	AT&T 5ESS	April 1988 internal
John Hopkins Medical Center	BRI	AT&T 5ESS	July 1988
C&P of West Virginia			
Commonwealth of Virginia	BRI	AT&T 5ESS	April 1988 1000-plus lines planned
West Virginia University	BRI	AT&T 5ESS	January 1989 800 lines planned
C & P Tel			
Federal National Mortgage Association	BRI	AT&T 5ESS	June 1988 400 lines
Bell of Pennsylvania			
Harrisburg, Pa.	BRI	NT DMS-100	November 1988 internal
Philadelphia	BRI	AT&T 5ESS	August 1988
Pittsburgh	BRI	AT&T 5ESS	1st quarter 1989
State of Pennsylvania	BRI	NT DMS-100	Contract pending
New Jersey Bell			
Navesink, Bellcore	BRI	Siemens EWSD interworking with AT&T 1A	February 1988 184 lines
Bell Labs, Holmdel, N.J.	BRI	AT&T 5ESS	September 1987 60 lines

BELLSOUTH

Southern Bell			
AT&T Network Systems	BRI	AT&T 5ESS	March 1988 450 lines
Prime Computer Inc.	BRI/PRI	AT&T 5ESS	April 1988 25 lines/commercial
Sun Trust Service Corp.	BRI	AT&T 5ESS	April 1988 50 lines/commercial
Hayes Microcomputer Products Inc.	BRI	AT&T 5ESS	April 1988 25 lines
Digital Equipment Corp.	BRI	AT&T 5ESS	April 1988
Contel Corp.	BRI	AT&T 5ESS	April 1988 35 lines/commercial
Heathrow	BRI	NT DMS-100	June 1988
North Carolina State University	BRI	NT DMS-100	N.A.

NYNEX

New York Tel			
Shearson Lehman Hutton Inc.	BRI	AT&T 5ESS	Started June 1988 30 lines
New York City	BRI	NT DMS-100	25 lines/internal
New York City	BRI	AT&T 5ESS	10 lines/internal
New York City	BRI	AT&T 5ESS	10 lines/internal
Tarrytown, N.Y.	PRI	NT DMS-100	2 lines/internal
New England Tel			
Boston	BRI	AT&T 5ESS	75 lines/internal
Boston	PRI	AT&T 5ESS	2 lines/internal
Southern New England Tel			
Aetna	BRI	AT&T 5ESS	Under installation

PACIFIC BELL

City of Fresno	BRI	AT&T 5ESS	November 1988 100 lines, 700 lines planned First services fall of 1989 completion winter 1990
Chevron Corp.	BRI/PRI	NT SL-100/DMS-100	Being installed, 110 lines
Lockheed Missiles and Space Co. Inc., Hayes Microcomputer Products Inc., AT&T Network Systems	BRI	AT&T 5ESS	September 1987-September 1988 55 lines
Federal Express	BRI	AT&T 1AESS NEAX 61E ISDN Advance	October 1988 50 lines

SOUTHWESTERN BELL

AT&T Network Systems	BRI	AT&T 5ESS	January 1987 2300 lines 4th quarter 1988
AT&T Technologies (Oklahoma City Works)	BRI	AT&T 5ESS	July 1988
Rockwell Communications Systems	BRI	AT&T 5ESS	December 1988 1200 lines planned
Shell Oil	BRI	AT&T 5ESS	September 1988 1000 lines, 6000 lines planned for early 1989
Southern Methodist University	BRI	Siemens EWSD	February 1988
3M Corp.	BRI	AT&T 5ESS	April 1988 1300 lines, 3185 lines planned
Tenneco Inc.	BRI	AT&T 5ESS	June 1988 2240 lines, 4340 lines planned for early 1989

U S WEST

U S West Communications

Arizona Department of Transportation, Arizona Department of Administration, Honeywell Bull, U S West Communications (formerly Mountain Bell)	BRI	NT DMS-100	November 1986 - May 1988 200 lines
GTE Communication Systems	BRI/PRI	GTE GTD-5 EAX	January 1987-July 1987
Mountain Bell	BRI	NEAX 61E ISDN Adjunct	February 1987
Intel Corp. Mountain Bell	BRI	AT&T 5ESS	February 1987-August 1987 50 lines
U.S. Bank of Oregon	BRI	NT DMS-100	March 1987-March 1988 200 lines
Control Data Corp.	BRI	NEAX 61E ISDN Adjunct	November 1987-November 1988 200 lines
AT&T Network Systems Denver	BRI/PRI	AT&T 5ESS	September 1988-1995 1000 lines/commercial
AT&T Network Systems Omaha	BRI	AT&T 5ESS	March 1989-1994 100 lines/commercial
3M Corp.	BRI	AT&T 5ESS	July 1988-1994 9000 lines planned/commercial
Boeing Corp.	BRI	AT&T 5ESS	November 1988 1000 lines planned/commercial
Martin Marietta	BRI	AT&T 5ESS	December 1988 25 lines*

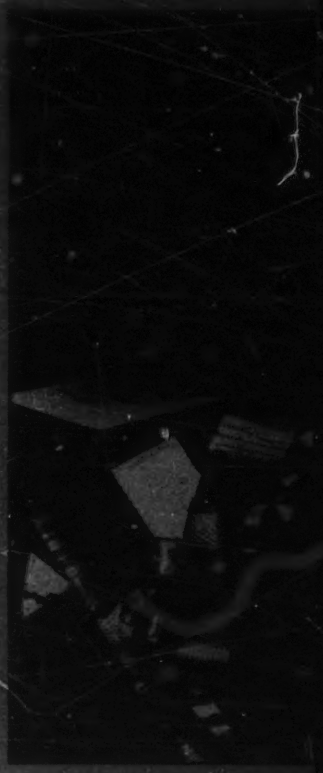
U S West Information Systems Inc.

University of Arizona	BRI	AT&T 5ESS	March 1989

AT&T

Boeing Corp.	BRI	AT&T 5ESS	5000 lines
Merrill Lynch	BRI	AT&T 5ESS	160 lines
Duke University	BRI	AT&T 5ESS	1000 lines by early 1989
Massachussetts Institute of Technology	BRI	AT&T 5ESS	4000 lines
American Express	PRI	AT&T System 85 PBX/4ESS	July 1988
American Transtech	PRI	AT&T System 85 PBX/4ESS	December 1987
First Data Resources Inc.	PRI	NT SL-1 PBX with AT&T 4ESS	N.A.
Lawrence Livermore Laboratory	BRI	AT&T 5ESS	June 1987 15,000 lines
Mather Air Force Base	BRI	AT&T 5ESS	August 1988
McDonnell Douglas Corp.	BRI	N.A.	Unannounced
NASA Legend	BRI	AT&T 5ESS	N.A.

BRI basic rate interface ISDN 2B+D
PRI primary rate interface ISDN 23B+D
U S West will announce three new ISDN customers in December
N.A. not available



Open *continued*

start the new year with 15,000 combined working ISDN lines, estimates Richard Snelling, Southern Bell's executive vice president-network. Snelling reports that practically every large Southern Bell customer that has issued a request for proposal to the company in the last six months has mentioned ISDN or stipulated that the service provider show "a willingness to provide an ISDN trial." To date, Southern Bell has six declared ISDN customers, and another 17 have agreed to deploy ISDN within the next 12 months, according to Snelling.

Given this interest, Snelling says, "We feel an urgent need to get our service order, installation and maintenance people up to speed."

Total orders for ISDN lines taken by the RHCs as of August 1988 were 43,365, reports the ISDN newsletter The Added Dimension. And Mike Vogel, switching sales support and TriVista director at AT&T Network Systems, says his company will have shipped 200,000 ISDN lines by the end of the year. (Northern Telecom was asked but declined to give a figure.)

Southwestern Bell currently leads the pack with 5000 ISDN lines in service and 18,000 under contract, says David Roe, Southwestern Bell district manager, advanced technology lab. Roe says more ISDN lines are being negotiated for 1989. The company, which developed a reputation after divestiture as the slowpoke among the telcos, achieved its leading edge status in ISDN lines by using ISDN, for now, as a way to upgrade POTS rather than deliver data services.

Pacific Bell, which has the smallest number of ISDN lines deployed, nevertheless envisions cutting over more lines in 1989. "Maybe 10,000 to 20,000," says Steve Mickels, director-ISDN product development.

To date, Pac Bell has orders for 148. The dramatic level of growth Pac Bell expects in one year indicates the optimism shared by the telcos.

Standards

ISDN lines, CPE applications and connectivity mean nothing, however, without standards. Mickels sees the telcos, CO and PBX vendors and applications developers all moving toward CCITT and ANSI standards.

"People are more aware that they cannot maximize entry into the telecom market if they don't standardize," says Mickels. "Europe, Japan and the U.S. all have different standards. The U.S. standards should prevail if for no other reason than the sheer magnitude of the market. The U.S. market is the jewel in the whole ISDN market."

Bruce Becker, vice president-planning at Centel, comments that the CO standards are "pretty locked in" for primary rate ISDN. "Both AT&T and Northern have committed to standards, and I don't see them moving away," he says. Centel is conducting a three-phase ISDN trial in Las Vegas, where it is now turning up two Northern Telecom DMS-100 switches. In the second phase, scheduled for early next year,

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Open *continued*

these two COs will be linked via SS7 over FO lines. "This should be one of the first dual-node field trials," Becker notes. But he and others say a serious shortage of innovative companies developing ISDN applications remains.

Becker is now turning his attention to the PBX and Centrex key system makers, where the norm is proprietary architecture. "This can have some pretty alarming consequences," he says.

By contrast, Southern Bell's Snelling is heartened by the signals he's seen from the CPE vendors. "Northern Telecom and others are talking about 'portability' for ISDN Centrex sets by mid-1989. I feel pretty good about that," he says. Currently Centrex sets are designed to work exclusively with particular CO switches. Even so, the Southern Bell executive states, "We don't plan on filing tariffs until there are standards."

Applications, Demand

Late last month, AT&T announced it was accelerating deployment of the primary rate interface (23B+D) on its network, with planned availability to 62 U.S. cities by mid-1998. AT&T currently offers PRI ISDN in 18 U.S. cities. AT&T's bullishness about ISDN's future is suggested by the fact that the carrier has begun explaining the technology in a TV advertisement.

AT&T is selling two services with its PRI product. An automatic number identification service, which it calls Information Forwarding 2, or INFO-2, presents the calling party's phone number to the customer. The second service, Call-by-Call Service Selection, allows customers to reallocate a single channel for different types of calls—voice or data, incoming or outgoing. The service works with AT&T's Accunet switched digital services, Megacom WATS and Megacom 800 services.

AT&T's PRI ISDN was filed with the FCC in April and commercially available in July. AT&T's first PRI ISDN customer, American Express, gave proponents of ISDN a shot in the arm earlier this year, when it revealed that its INFO-2 application for an 800-type operator service yielded a 17% gain in productivity. AT&T says it has worked with approximately 140 customers on ISDN feasibility and that these customers' demands are dictating the cities to which PRI ISDN will be offered.

On the other hand, US Sprint, which late last month announced 100% conversion to SS7 *(Telephony, Nov. 28, page 3)*, will move into ISDN only as the market demands, according to Fred Lawrence, Sprint's executive vice president of network development. Lawrence said at the time of the SS7 announcement that he was still getting mixed signals from the customers about whether they need ISDN yet.

Telco officials for the most part believe next year will bring incremental changes toward wider-scale ISDN. Pac Bell's Jerry Lanich, for one, doesn't see ISDN applications changing much in 1989. Intraoffice connectivity is not possible until SS7 is deployed, so Lanich expects this status quo to remain for another two years.

Randy Friedman, manager-product and service delivery at Bell Atlantic, agrees. Because SS7 will not be ubiquitous, he explains, the network will be restricted to "islands" of ISDN in 1989.

Roe at Southwestern Bell expects significant progress on SS7 access and interworking between ISDN switching systems to have a major impact on ISDN applications and products. Pac Bell's Mickels also sees connectivity as a central issue in '89.

"ISDN is not really creating new applications," says Mickels, "but is instead allowing greater connectivity of the network. As the technology matures, you will have connectivity between LATAs, offices and countries that will allow greater use of the applications."

"This is the year that companies must develop deployment strategies, understand customer demands and get closer to ISDN pricing strategies," he concludes.

But how important is volume at this stage? One of BellSouth's operating companies, Southern Bell, has started delivering ISDN to the home over fiber at Heathrow, Fla., a high-tech residential and business community. And at Globecom '88 Southern Bell's Snelling called on other carriers and vendors, domestically and internationally, to conduct their own Heathrows.

Understanding how the customer will use ISDN is important to selling it, says Joe Cornacchio, staff director-ISDN strategic planning at Nynex.

Accordingly, Nynex is conducting extensive market research on production, price, positioning of the product and promotion. "Market research is developing what those products are and how they will be produced," says Cornacchio. He expects the market research to be completed by February.

"We will not be selling 2B+D to the customer but the services it allows," Cornacchio says. ■